

Serial No. 10/693,602
Response and Amendment

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A gas filter for removing a contaminant from a gas comprising an absorptive system, wherein the absorptive system comprising containing:
a polymer matrix ~~substantially free of polymer crosslinking;~~ and
one or more reactive additives ~~in contact with the polymer matrix;~~
wherein the absorptive system comprises an absorption capacity of at least about 0.01 gram of captured contaminants per gram of the absorptive system or a water content of at least about 5 percent by weight.
2. (Currently Amended) The gas filter of claim 1, wherein the polymer matrix comprises a polymer having a diffusivity of greater than 10^{-8} cm²/sec, ~~and or~~ a T_g of less than about 20 °C.
3. (Currently Amended) The gas filter of claim 2, wherein the polymer ~~is selected from the group consisting~~ comprises at least one of polyethylene/polypropylene random copolymers, poly(dimethylsiloxane), styrene-butadiene random and block copolymers, poly(vinyl chloride) plasticized with dioctyl phthalate, poly(acrylamide) plasticized with water, and poly(acrylamide) plasticized with glycerol, ~~and combinations thereof.~~
4. (Currently Amended) The gas filter of claim 3, wherein the polymer comprises a high molecular weight poly(acrylamide) having a weight average molecular weight ranging from about 1 million to about 50 million.
5. (Currently Amended) The gas filter of claim 1, wherein the one or more reactive additives comprise water, catalytic reactants, stoichiometric reactants, catalytic/stoichiometric reactants, acid-scavenging agents, base-scavenging agents, reactive nanoparticles, or a combination thereof.
6. (Canceled)

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7. (Currently Amended) The gas filter of claim 6, wherein the one or more reactive additives comprise one or more of a transition metal, a transition metal salt, sulfonic acid, a carboxylic acid, a-phosphoric acid, a-benzoic acid, NaOH, ethylene diamine, an amine, Na₂CO₃, a primary amine, and water.
8. (Currently Amended) The gas filter of claim 7, wherein the one or more reactive additives comprise sulfonic acid and water.
9. (Currently Amended) The gas filter of claim 7, wherein the one or more reactive additives comprise an amine and water.
10. (Currently Amended) The gas filter of claim 7, wherein the one or more reactive additives comprise reactive nanoparticles.
11. (Currently Amended) The gas filter of claim 1, wherein the one or more reactive additives are uniformly distributed throughout the polymer matrix.
12. (Currently Amended) The gas filter of claim 1, wherein the one or more reactive additives form a layer that is separate from but in contact with the polymer matrix.
13. (Canceled)
14. (Canceled)
15. (Currently Amended) The gas filter of claim 1, wherein the absorptive system further comprises one or more non-reactive additives.
16. (Currently Amended) The gas filter of claim 15, wherein the one or more non-reactive additives comprise one or more of sorbitol, water, and glycerol.

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17. (Currently Amended) The gas filter of claim 1, wherein the absorptive system comprises a high molecular weight poly(acrylamide) having a weight average molecular weight ranging from about 1 million to about 50 million, sulfonic acid beads, sorbitol, water, and glycerol.

18. (Currently Amended) The gas filter of claim 1, further comprising a substrate, wherein the ~~a~~-absorptive system ~~coats-contacts~~ at least a portion of an outer surface of the substrate.

19. (Canceled)

20. (Currently Amended) The gas filter of claim ~~18~~9, wherein the substrate comprises ~~a non-woven fabric, a woven fabric, a knitted fabric, a film, a foam, a honeycomb structure, particulate material, a mesh or screen, a fiber, a flake, a powder, or a polymeric bead, and wherein the substrate is formed from a~~ polyolefin, a polyethylene, a polypropylene, a polyester, a polyamide, nylon 6, nylon 66, a cellulosic material, or a combination thereof.

21. (Currently Amended) The gas filter of claim ~~19~~20, wherein the substrate comprises a polyamide non-woven fabric.

22. (Currently Amended) The gas filter of claim 18, further comprising a housing ~~to~~ which at least partially ~~contain-holds~~ the absorptive system, the substrate, or both.

23. (Canceled)

24. (Currently Amended) A gas filter for removing a contaminant from a gas comprising:

an absorptive system ~~containing-comprising~~ (i) a polymer matrix ~~substantially free of crosslinking~~, wherein the polymer matrix ~~contains-comprises~~ at least one ~~polymer selected~~

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~~from the group consisting of~~ poly(acrylamide), polyethylene/polypropylene random copolymers, poly(dimethylsiloxane), styrene-butadiene random and block copolymers, and poly(vinyl chloride) plasticized with dioctyl phthalate; and (ii) one or more reactive additives ~~in contact within the polymer matrix, wherein the absorptive system further comprises an absorption capacity of at least about 0.01 gram of captured contaminants per gram of the absorptive system material or a water content of at least about 5 percent by weight;~~

a substrate, wherein the absorptive system ~~coats~~ contacts at least a portion of an outer surface of the substrate; and optionally,

~~an optional~~ housing ~~to which~~ at least partially ~~contain~~ holds the absorptive system, the substrate, or both.

25. (Canceled)

26. (Canceled)

27. (Canceled)

28. (Canceled)

29. (Canceled)

30. (Canceled)

31. (Canceled)

32. (Canceled)

33. (New) The gas filter of claim 1, wherein the absorptive system is biostat.

34. (New) The gas filter of claim 1, wherein the gas is air.

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35. (New) A method of removing a contaminant from a gas, comprising contacting a gas with a gas filter, wherein the gas filter comprising an absorptive system, wherein the absorptive system comprising a polymer matrix and one or more reactive additives, and wherein the absorptive system comprises an absorption capacity of at least about 0.01 gram of captured contaminants per gram of the absorptive system or a water content of at least about 5 percent by weight.
36. (New) The method of claim 35, wherein the polymer matrix comprises a polymer having a diffusivity of greater than 10^{-8} cm²/sec or a T_g of less than about 20 °C.
37. (New) The method of claim 35, wherein the polymer comprises poly(acrylamide).
38. (New) The method of claim 35, wherein the one or more reactive additives comprise one or more of a transition metal, a transition metal salt, sulfonic acid, carboxylic acid, phosphoric acid, benzoic acid, NaOH, ethylene diamine, an amine, Na₂CO₃, and water.
39. (New) The method of claim 35, wherein the one or more reactive additives comprise sulfonic acid and water, or an amine and water.
40. (New) The method of claim 35 wherein the one or more reactive additives comprise reactive nanoparticles.
41. (New) The method of claim 35, wherein the absorptive system further comprises one or more non-reactive additives.
42. (New) The method of claim 35, further comprising a substrate, wherein the absorptive system contacts at least a portion of an outer surface of the substrate.
43. (New) The method of claim 42, wherein the substrate comprises polyolefin,

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polyethylene, polypropylene, a polyester, a polyamide, nylon 6, nylon 66, a cellulosic material, or a combination thereof.

44. (New) The method of claim 42, wherein the substrate comprises a polyamide non-woven fabric.

45. (New) The method of claim 35, further comprising a housing which at least partially holds the absorptive system, the substrate, or both.